**NASA Headquarters
Information Technology & Communications Division**

**Information Technology Tactical Plan
FY2009, FY2010 and FY2011**

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**Prepared by
Headquarters Information Technology and Communications Division
and Indyne Corporation**

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1. **Purpose**

This document provides the National Aeronautics and Space Administration (NASA) Headquarters (HQ) Information Technology (IT) Tactical Plan for fiscal years 2009, 2010, and 2011. It serves as an informational and planning document, presenting anticipated capital investments by the Information Technology and Communications Division (ITCD) that will enable IT infrastructure enhancements and upgrades, new IT initiatives, and compliance resolution. From a CPIC perspective, the items listed in this tactical plan are Development, Modernization and Enhancement (DME) investments, i.e. this document contains proposals for new and improved capabilities. Steady State investments are funded by ITCD's core activities. Furthermore, the associated cost estimates represent only DME hardware and software purchases – the labor component is also funded (with very limited and explicitly designated exceptions) in the ITCD core budget.

The tactical plan is useful for technology planning, apprising customers of existing and planned projects and allowing them to request and HITCD to reflect re-prioritization as conditions dictate. It is also useful for HQ customers in their budget planning. The estimates for 2009 provide a finalized expenditure plan, those for 2010 provide an expenditure forecast, and those for 2011 inform HQ's and the Agency's 2011 budget request. Finally, the tactical plan is useful for workforce planning. The FTE estimates, though funded separately, present HITCD's anticipated skill and manpower level requirements.

2. Scope

This Tactical Plan is devised as a planning document to help HQ customers and ITCD focus manpower and plan budgets, address the requirements of the HQ community, and maintain compliance with Agency and Federal mandates. The plan proposes and provides a basic priority, benefits, rationale, and approximate (non-labor) cost for each proposed initiative supporting the customers of HQ IT services.

Figure 1 below illustrates a Technology Planning and Implementation Framework and indicates how the Tactical Plan fits into this framework. As shown, the proposed investments support both strategic and operational objectives.
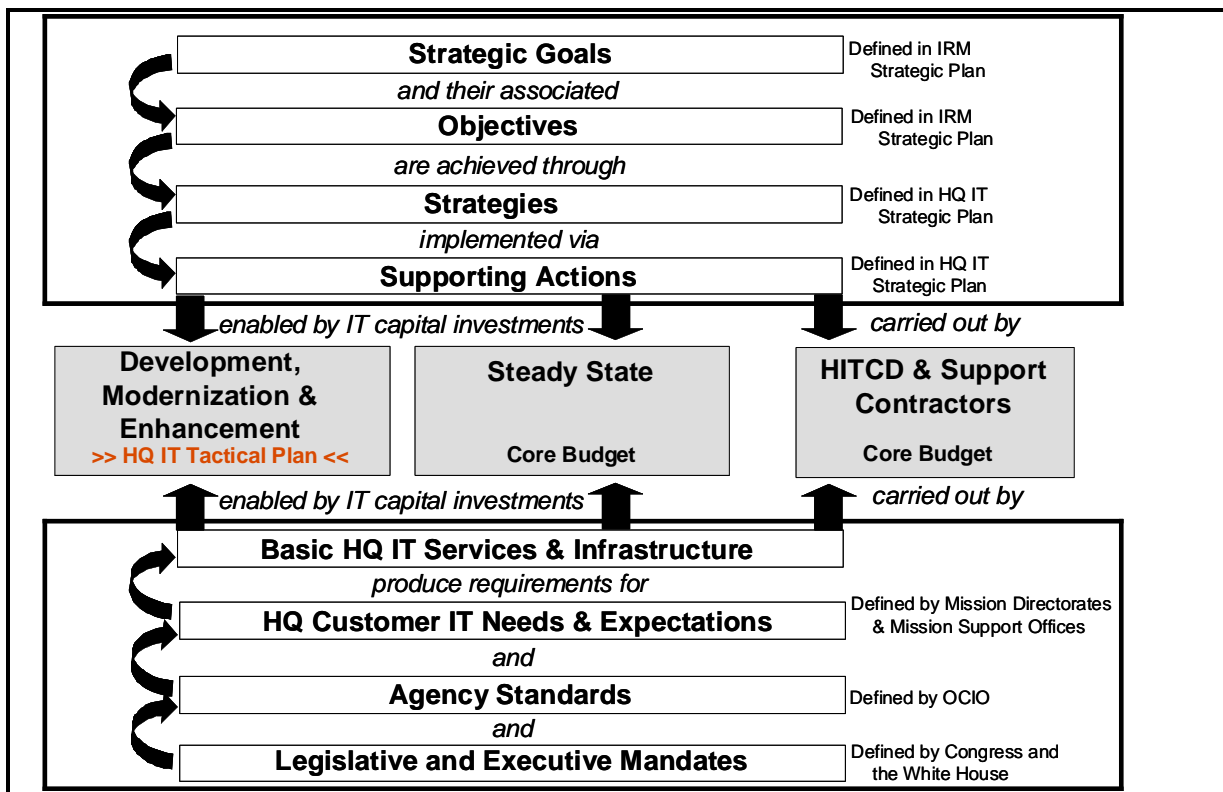
Figure 1 –HQ Information Technology Planning and Implementation Framework

In general, this plan proposes improvements and enhancements to HQ-wide IT services provided and managed by ITCD, which reports to the HQ Office of Infrastructure and Administration (OIA). However, the Tactical Plan is not an exhaustive list of every activity in which the HQ ITCD is engaged, nor is it a complete list of all projects considered. Rather, it is a list of projects bounded by and contained within a specific ITCD hardware and software investment budget. Services sited at HQ that are not part of the ITCD-provided and managed infrastructure (e.g. Mission directorate IT systems) may influence but are not a part of this plan.

The Tactical Plan is responsive to legislative (agency and Federal) mandates, anticipated or actual customer services, and infrastructure upgrades. To clearly communicate activities to customers and stakeholders, it describes investments that enable achievement of Agency/OCIO strategic objectives and initiatives presents each activity with a description, an informational estimate of core labor FTEs and specific direct costs (ODCs). A summary table in Appendix 1depicts each activity by Capital Planning and Investment Control (CPIC) priority, functional category, and strategic alignment.

3. Planning Process

Figure 2 below presents a Technology Planning and Implementation Timeline that incorporates the contributing precursors to the tactical plan. It also shows how the tactical plan provides the basis for project definition and implementation and supports outyear budget submissions. Note that the 2010 Tactical Plan may make changes to this plan's project list and/or prioritization for 2010 and 2011.
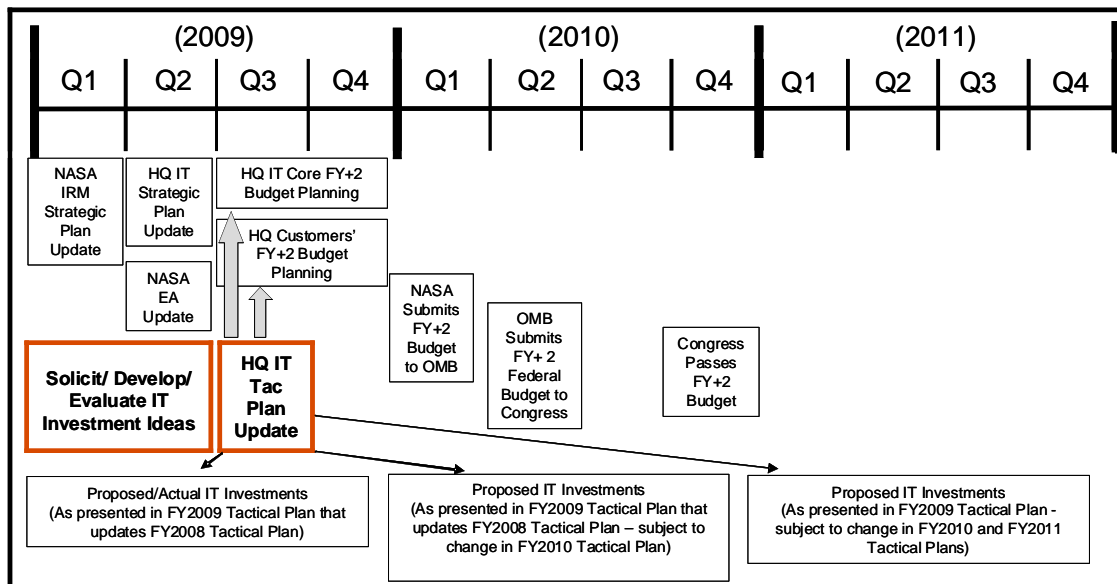
Figure 2 –HQ Information Technology Planning and Implementation Timeline

Process Stages[1]

Initiative Solicitation and Generation

Each year's Tactical Plan comprises a three-year set of planned and ongoing investments that is strongly influenced, although not bound, by that of its predecessor.   The process of constructing the Tactical Plan begins with collecting and organizing candidates for new initiatives, extending existing activities, or scheduling previously identified candidates that had not been started. In the timeline above, this is shown as beginning with the fiscal year. During Q1 and Q2, HITCD actively solicits ideas from its customers, but in reality the opportunity for collecting strong candidates is continuous. Candidates are often promoted by customers but also by HITCD, particularly in response to Agency CIO directives or HQ infrastructure requirements.

Candidate Categorization, Prioritization and Ranking

Each Tactical Plan is first formed from its predecessor. Activities that are still in process and/or strong candidates that were not started form the base for the initial draft plan. Any new legal requirements (e.g. required software licenses) are added and given high priority. Also given preference are new candidates that may have been explicitly requested by customers or developed by ITCD in response to or anticipation of customer needs. Then a first pass of priority ordering is applied to Agency mandates, completion of previous commitments, and new initiatives roughly in that order (legal, agency compliance, completion of previous commitments, new initiatives). Next, a pass is made to assign candidates to their most relevant CPIC categories. A rough order of magnitude estimate of associated costs for hardware and software, FTE requirements (headcount,

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[1] There is much that can be improved in the current process and a separate activity to iteratively incorporate improvements will be reflected in the next (and subsequent) versions of the Tactical Plan.

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not cost) and scheduling is then added. This initial draft is then routed for comment and contribution.

New ideas or recommended edits are merged and then reviewed with selected HQ experts and stakeholders, usually resulting in a new revision that assigns priority rankings of Mandatory, Preferred or Optional.

Final Selection Process

The initial selection list is made up of just the mandatory initiatives and their estimated costs. The overall annual totals are compared to recent tactical plan requests to determine whether the new requests are within a reasonable range of former requests. If within said range, the selected items remain in the draft Tactical Plan that is distributed to the CAC for review. If not within range, a number of options are explored. First, an attempt is made to adjust project timing to see if shifting expenditures across years reduces the variance(s). If one or more totals remain high relative to past requests, ITCD may decide to proceed with the higher request. Alternatively, ITCD may comparatively rank the initiatives designated as Mandatory and re-prioritize or delay those with the lowest rank. If one or more totals remain low relative to past requests, ITCD may decide to proceed with the lower request. Alternatively, ITCD will use the rankings created for the Preferreds, and if necessary, the Optionals to add initiatives to the list.

4. Strategic Drivers

Guiding principles and business drivers influence the selection and ranking of initiatives in this plan, many of which are derived from the 2006 NASA Information Resources Management Strategic Plan as mandated by NPD 2800.1A. These principles are described below along with Tactical Plan initiatives that support them. A table mapping all of the projects to their supported business drivers is in Appendix 3.

4.1. Adapt to Emerging Technologies

"Provide an IT infrastructure that can evolve and adapt to emerging technologies and service models."

IT within NASA has evolved largely through a bottom-up approach, with many related parallel efforts emanating from Centers and programs. This has resulted in an architecture that (as a whole) is slow to adapt and interoperates only at great expense.

NASA has facilities around the world, and mobile computing eliminates the concept of business hours. It is HQ's goal to provide IT services that are available at all times and the technology to access those services from any location. As a design discipline, our services must be provided in a way to assure that they are always available. Highly available architectures reduce the cost of maintenance and service, and position us favorably to have our services mirrored at multiple sites for continuity of operations.

NASA has huge repositories of information and institutional knowledge that it is unable to fully leverage, due in part to limitations in information technology. As these technology barriers are lifted, NASA HQ must continue to press forward with initiatives to free this knowledge, so it can be productively used. Fundamental changes are required in the way we acquire, process, and manage data in order to assure that information and data assets can be discovered, trusted, and repurposed.

Tactical initiatives included in the FY2009-2011 plan that support this strategic driver include:

- Cisco Unified Personal Communicator SoftPhone
- Continuation of ColdFusion Upgrade
- Continuation of Oracle Upgrade to 10G
- COTS Survey Tool
- Customer Service Enhancements
- Disk-to-Disk Enterprise Backup
- Enhance Desktop Recovery Tivoli Storage Manager (TSM)
- Enhance Enterprise Backup
- Enhance Enterprise Storage
- Implement Automated Requirements, Test Suite, and Test Data Development
- Implement IPTV
- Implement Server Virtualization
- Implement Web Link Checker/Crawler
- Improve Monitoring Capabilities with NETIQ Security Manager
- Investigate New Web Application Reporting Tools
- IPv6 Capability for Perimeter and Core
- Life Cycle Replacement of HQ Firewall Systems HW
- Life Cycle Replacement of Servers
- Life Cycle Replacement of the HQ Wireless Network
- MicroPact entelliTrak COTS Tool
- Restructure and Consolidate HQ VLANs
- Secure Remote Access
- Service-Orientated Architecture (SOA)

- Update HQ Based Search Engine
- Update Multimedia Architecture/Web Streaming
- Update Multimedia Offsite Support Capabilities
- Upgrade the HQ Network Trunk Interconnect to 10G

4.2. **Common Tools and Services**

"Optimize investments in mission and program-unique IT systems by utilizing common infrastructure tools and services where practical."

An over-arching goal at NASA, and the inspiration for many ongoing projects, is the objective of enabling NASA to work as a single team without regard to geography or organizational affiliation. In an effort to reduce costs, Agency consolidation has motivated numerous projects to migrate infrastructure and operations to a central provisioner, with more to come in the future.

Tactical initiatives included in the FY2009-2011 plan that support this strategic driver include:
- Agency "Class" VoIP Disaster Recovery/Avoidance Solution Continuity of Operations Plan (COOP)
- Assess the Benefit Associated with Unity and NOMAD Interoperability
- Common Set of Development/DBA Tools
- Continuation of Oracle Upgrade to 10G
- COTS Survey Tool
- Design and Implementation of VoIP Intercluster Trunking
- Implement Automated Requirements, Test Suite, and Test Data Development
- Implementation of DHCP across the HQ Private Network
- MicroPact entelliTrak COTS Tool
- Service-Orientated Architecture (SOA)
- Update HQ Based Search Engine

4.3. Mission and Customer Focus

"Provide a mission and customer focus to the provisioning of common IT services across NASA."

IT is never an end in itself, but rather a tool for fulfilling NASA missions and meeting its objectives. We maintain a customer focus to guide us to the correct solution for a given situation, then work to deliver that solution with quality and reliability. User outreach will be provided to make sure our customers are aware of our valuable services.

Tactical initiatives included in the FY2009-2011 plan that support this strategic driver include:

- Agency "Class" VoIP Disaster Recovery/Avoidance Solution Continuity of Operations Plan (COOP)
- Assess the Benefit Associated with Unity and NOMAD Interoperability
- Caching Proxy/Reverse Proxy Architecture
- Cisco Unified Personal Communicator SoftPhone
- COTS Survey Tool
- Customer Service Enhancements
- Design and Implementation of VoIP Intercluster Trunking
- Disk-to-Disk Enterprise Backup
- Enhance Desktop Recovery Tivoli Storage Manager (TSM)
- Enhance Enterprise Storage
- Implement 1 Gig to Select Desktops to Support Digital Asset Management
- Implement IPTV
- Implement Web Link Checker/Crawler
- Implementation of DHCP across the HQ Private Network
- Life Cycle Replacement of Servers
- Life Cycle Replacement of the HQ Wireless Network
- Restructure and Consolidate HQ VLANs
- Secure Remote Access
- Update Multimedia Architecture/Web Streaming
- Update Multimedia Offsite Support Capabilities
- Upgrade the HQ Network Trunk Interconnect to 10G
- VoIP Hardware Life Cycle Replacement

4.4. Security

"Protect and secure the Agency's information assets."

IT Security is not something you buy, but rather a discipline that must be integrated into every service provided to NASA. We must believe in our data and ensure that it is both credible and available. The more widely and pervasively IT is deployed, the greater the need to have security "built in" and not "bolted on" as an afterthought. NASA must explore mechanisms to drive down the increasing costs of security assurance plans, equipment, and reporting, while maintaining compliance with Federal and Agency mandates.

Tactical initiatives included in the FY2009-2011 plan that support this strategic driver include:

- Caching Proxy/Reverse Proxy Architecture
- Continuation of ColdFusion Upgrade
- Data Encryption Capability for Enterprise Storage
- Disk-to-Disk Enterprise Backup
- Enhance Desktop Recovery Tivoli Storage Manager (TSM)
- Enhance Enterprise Backup
- Implement Automated Requirements, Test Suite, and Test Data Development
- Implement Policy Compliance Scanning
- Implement Server Virtualization
- Implementation of DHCP across the HQ Private Network
- Improve Forensic Capabilities
- Improve IDS Infrastructure
- Improve Monitoring Capabilities with NETIQ Security Manager
- Life Cycle Replacement of HQ Firewall Systems HW
- Secure Remote Access
- Security Content Automation Tools S-CAP

4.5. Unified Investment Portfolio

"Maintain an Agency-wide IT investment portfolio in alignment with missions and business needs."

As always, we must be good stewards of NASA resources by reducing cost and increasing efficiency and automation. We continue the move away from manual processing and towards fully automated or "lights out" operations. We also seek to reduce cost by adopting common architectures and leveraging NASA's vast economies of scale. Finally, managing our services as an integrated portfolio is a required step in migration to Service Orientated Architectures and assuring alignment with the Agency's Enterprise Architecture.

Tactical initiatives included in the FY2009-2011 plan that support this strategic driver include:

- Assess the Benefit Associated with Unity and NOMAD Interoperability
- Common Set of Development/DBA Tools
- Continuation of ColdFusion Upgrade
- Continuation of Oracle Upgrade to 10G
- COTS Survey Tool
- Disk-to-Disk Enterprise Backup
- Enhance Desktop Recovery Tivoli Storage Manager (TSM)
- Implement Automated Requirements, Test Suite, and Test Data Development
- Implement Server Virtualization
- Improve Monitoring Capabilities with NETIQ Security Manager
- Investigate New Web Application Reporting Tools
- Life Cycle Replacement of HQ Firewall Systems HW
- MicroPact entelliTrak COTS Tool
- Restructure and Consolidate HQ VLANs
- Service-Orientated Architecture (SOA)
- Update HQ Based Search Engine
- Update Multimedia Architecture/Web Streaming
- Update Multimedia Offsite Support Capabilities

4.6. Effective Work Force

"Maintain a strong IT workforce through effective human capital management."

NASA's most important resource is its people, thus the greatest gains are to be found by enabling communication and collaboration. Whether it is efficient broadcast of information, collaborative workgroups, or reliable person-to-person communications, the reliability, capabilities, and quality of collaboration tools must be improved continuously. We will promote designs and approaches that will enable our customers to discover information relevant to their activities, communities of similar interests, and more automated mechanisms for obtaining and sharing information.

Virtually all tactical initiatives included in the FY2009-2011 plan support this strategic driver. Those activities with direct support include:

- Customer Service Enhancements
- Enhance Desktop Recovery Tivoli Storage Manager (TSM)
- Enhance Enterprise Backup
- Enhance Enterprise Storage
- Implementation of DHCP across the HQ Private Network
- Life Cycle Replacement of the HQ Wireless Network
- Secure Remote Access
- Update HQ Based Search Engine

5. Additional Drivers

Along with the Strategic Drivers presented above, there are Agency actions and directives as well as technological trends and advances that influence this Tactical Plan.

5.1. Agency Drivers

- Budget-driven efforts to increase efficiency
- CPIC guidelines and requirements to improve IT investment process and results
- e-Government initiatives to consolidate government-wide operations
- Enterprise Architecture initiatives to manage more strategically NASA's information and information technology
- HSPD12 initiatives to standardize and improve access safeguards for physical and information assets
- I3P initiatives to consolidate IT support contracts
- IT Security-related legislation to manage information according to NIST risk-based standards
- OneNASA-driven efforts to increase collaboration
- PII initiatives to increase protection of personal information

5.2. Technology Drivers

- Backup and Storage Innovation
- COTS Operational Support Systems
- Multimedia content streaming
- Obsolescence (Actual and Vendor Dictated)
- Open Source
- Semantic Web
- Service Oriented Architecture
- Web 2.0

6. Tactical Plan Initiatives in Detail

This section describes each initiative in the portfolio of initiatives that are or may be implemented within the next thirty-six months. They are organized by CPIC category (see Appendix 2 for detailed descriptions).

6.1. Voice Services

All Information Technology (IT) investments required for providing voice services to users not including server/hosting hardware included under Data Center and services provided by Local Area Networks or Wide Area Networks.

6.1.1. Agency "Class" VoIP Disaster Recovery/Avoidance Solution Continuity of Operations Plan (COOP)

Initiative Summary	Enables inbound and outbound trunk failover between NASA centers by re-routing traffic to another NASA Voice over Internet Protocol (VoIP) center.
Anticipated Benefits	Provides backup communications link. Will allow inbound and outbound dialing to remain largely unaffected if HQ were to have a Public Switched Telephone Network (PSTN) trunk failure.. In particular, increases reliability of telephone services during missions.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
	●	●			●	**M**	**28**

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
0.25	**$50,000**			**0.25**	**$100,000**

6.1.2. Design and Implementation of VoIP Intercluster Trunking

Initiative Summary	Allows for voice communications across the Wide Area Network (WAN). Calls can be originated and received by any NASA center with VoIP capability across the NASA network infrastructure, bypassing the PSTN.
Anticipated Benefits	Reduces phone costs, provides service redundancy, and implements features such as direct call forwarding, 5 digit dialing and other advanced VoIP features.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
	●	●			●	**P**	**37**

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
0.25	$50,000	0.25	$50,000		

6.1.3.*Assess the Benefit Associated with Unity and NOMAD Interoperability*

Initiative Summary	Determines the costs and benefits related to the potential interoperability between NASA HQ voicemail and NASA Agency Email included in the NASA Operational Messaging and Directory Service (NOMAD).
Anticipated Benefits	Informs decision whether to implement voicemail/email interconnectivity. Provides data to support the decision package relating to voicemail/e-mail interconnections. Interconnecting voice mail with e-mail has the potential to both improve the successful connection rate between communicators and the increase the usefulness of the communicated information.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
	●	●		●	●	**P**	**40**

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.25					

6.1.4.*Implement 1 Gig to Select Headquarters Desktops*

Initiative Summary	For selected customers with high bandwidth requirements, replaces their current phones with 1 Gb/s 7975 Cisco phones.
Anticipated Benefits	The NASA HQ network infrastructure is capable of providing 1Gb/s to a limited number of customers, but bandwidth to the desktop is constrained by the standard issue 100 Mb/s Cisco 7970 VoIP phone. Increases bandwidth to these end-users by an order of magnitude (1Gb/s), which will be used initially by PAO (photography), HQ Graphics, and a development room for high-end technology demonstrations.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
		●			●	**M**	**30**

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
0.1	$50,000	0.1	$50,000	0.1	$50,000

6.1.5. *Cisco Unified Personal Communicator SoftPhone*

Initiative Summary	Implements the Cisco Unified Personal Communicator SoftPhone, a desktop application that provides telephony applications and services.
Anticipated Benefits	Provides access to voice, video, instant messaging, web conferencing, voicemail, and presence information to customers at HQ and particularly away from the office.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●		●			●	**P**	35

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.25	$25,000	.5	$25,000		

6.1.6. *VoIP Hardware Life Cycle Replacement*

Initiative Summary	Procures new and more advanced VoIP servers and gateways.
Anticipated Benefits	Ensures that both hardware and software components of the VoIP infrastructure remain reliable and are consistently available.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
		●			●	**M**	16

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
0.75	$175,000	0.75	$250,000		

6.2. Wide Area Network (WAN)

All Information Technology (IT) investments required for supporting network communications between NASA Local Area Networks (LANs), NASA data centers, and external partners.

6.2.1. *Secure Remote Access*

Initiative Summary	The HQ Public IPsec Virtual Private Network (VPN) service uses Cisco hardware that is approaching End of Life (EOL) and end of vendor support and needs to be replaced. With this project, NASA HQ will evaluate different options for replacing the IPSec VPN service, select and implement a solution.
Anticipated Benefits	The HQ Public IPsec Virtual Private Network (VPN) service uses Cisco hardware that is approaching End of Life (EOL) and end of vendor support and needs to be replaced. With this project, NASA HQ will evaluate different options for replacing the IPSec VPN service, select and implement a solution.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●	●		●	**M**	**24**

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
		1	$80,000	1	

6.3. Local Area Networks (LAN)

Local Area Network (LAN) components refer to all Information Technology (IT) investments required to provide networking services within a building, campus, data center or Center, including hardware, software, and services.

6.3.1. *Upgrade the HQ Network Trunk Interconnect to 10G*

Initiative Summary	The throughput capacity of the HQ network backbone was recently upgraded from 1Gbps to 2Gbps in order to provide sufficient bandwidth to support the Desktop Computer Backup project. This project will upgrade the NASA HQ network infrastructure sufficiently to support a 10-gigabit network backbone and 1 gigabit to all LAN ports.
Anticipated Benefits	Adds capacity in response to continuing growth in peak network utilization. Makes possible current and future initiatives that: • Supply/use 1 Gbps throughput to desktop computers • Increase use of large network-based storage such as the 100TB NetApp 3070 • Increase use of video, real-time collaboration, and "rich client" real-time applications

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●		●			●	**M**	**8**

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
1	$50,000			1	

6.3.2. *Life Cycle Replacement of the HQ Wireless Network*

Initiative Summary	Both the hardware and software infrastructure supporting the HQ wireless network is approaching end-of-life and end-of-vendor support, and life cycle replacement will be performed as part of this project. Roaming for private wireless currently works on a per-floor basis. This project will analyze the feasibility of enhancing the private wireless network's roaming capability.
Anticipated Benefits	Reduces administrator costs and increases reliability by switching to newer and more modern equipment. Maintains access to vendor support that would otherwise be terminated on the existing equipment. Improves roaming capabilities in HQ building.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●		●			●	**M**	**23**

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
1	$30,000		$150,000	1	

6.4. Video Infrastructure Services

All Information Technology (IT) investments required for supporting video distribution and video conferencing services used by NASA including hardware, software and support services - not including Local Area Networks or Wide Area Networks.

6.4.1.Implement IPTV

Initiative Summary	Implements an Internet Protocol Television (IPTV) pilot involving a select number of end users to determine feasibility and value. Involvement from NASA TV will be necessary in order to complete the pilot. An additional pilot of streaming to new media platforms such as PDA, Google Gadgets, and Apple Widgets will be investigated and prototyped.
Anticipated Benefits	The pilot will help develop architectures that allow NASA HQ to scale will enable NASA to scale to a more robust video architecture. Tests of the new media platforms will inform future video delivery and reception solutions.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	Mandatory Optional Preferred	
●		●			●	P	39

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
			$250,000		

6.5. Workstations

IT investments required to provide desktop computing services to users: hardware and software (operating systems, applications, and utilities) and services (including design, build, operations, multipurpose help desks, support, and maintenance services). Includes peripherals/printers (networked and local attached), workstation virus protection.

6.5.1.Enhance Desktop Recovery Tivoli Storage Manager (TSM)

Initiative Summary	Upgrades the Tivoli Storage Manager (TSM) software to the latest stable release. Investigates Continuous Data Protection (CDP) and implements if appropriate.
Anticipated Benefits	Ad-hoc customer-driven backup and restore for select files will be implemented as well as secure remote backup services for customers on travel. Capacity planning will be used to optimize server and storage hardware. User backups will be scheduled during off-peak network intervals to ensure users can be backed up and restored during the shortest window.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	Mandatory Optional Preferred	
●		●	●	●	●	M	9

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.5	$50,000	.5	$50,000	.5	$50,000

6.6. Data Center

A Data Center is a collection of IT hardware and software that is used for multiple purposes and often related, computing services. This category includes data storage (mass storage systems, digital data storage services, supercomputers, computing clusters such as Beowulf) including hardware, software, services, etc.), database management and administration services, data/document management systems, and disaster recovery services. In addition, the Data Center category includes server/hosting hardware and associated operating system software and system administration, which are not part of a shared Data Center.

6.6.1. Life Cycle Replacement of Servers

Initiative Summary	Evaluate legacy server platforms and upgrade the hardware and operating systems to newer technology where appropriate for supporting Agency and Federal mandates like HSPD12, PII encryption, etc. Servers in need of upgrade will also be evaluated to determine whether their services can be consolidated.
Anticipated Benefits	Replaces of end-of-life, no longer vendor-supported hardware and software. Newer technology will provide greater efficiencies, as will any discovered consolidation opportunities. The deployment of current operating system software will increase security, provide greater reliability, and simplify administration of the NASA HQ server infrastructure.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●			●	M	15

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.5	$225,000	.5	$225,000	.5	$250,000

6.6.2. Enhance Enterprise Storage

Initiative Summary	Replace storage components approaching end-of-life. Employ capacity planning to forecast HQ enterprise storage requirements. Procure any additional Serial Attached Technology Attachment (SATA) or Fiber Channel (FC-AL) drives to augment or replace existing storage as indicated by capacity planning.
Anticipated Benefits	Ensures that enterprise disk storage is of sufficient capacity and throughput to meet current and projected requirements.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●			●	M	17

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.5	$200,000	.5	$200,000	.5	$600,000

6.6.3.*Enhance Enterprise Backup*

Initiative Summary	Employ capacity planning to forecast enterprise tape backup requirements. Replace any backup storage components approaching end-of-life, and add additional equipment to forecast requirements. Replace the inadequate 8 LTO 2 with new generation LTO4 drives.
Anticipated Benefits	Ensures that enterprise backup tape storage is of sufficient capacity and throughput to meet current and projected requirements. Increases data reliability and integrity.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●			●		●	M	25

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.5	$50,000			.75	$300,000

6.6.4.*Restructure and Consolidate HQ VLANs*

Initiative Summary	Restructure NASA HQ VLANs into a facility-based architecture, aligning them with core business functions and services that change only infrequently. Potentially extend this segregation to things that can be logically and functionally separated, regardless of whether they vary or not.
Anticipated Benefits	Restructuring and consolidating VLANs will result in reduced administrative overhead. The redesign of the network from organization-based to facility-based VLAN architecture will greatly simplify the network and permit the implementation of features designed to minimize disruption of service in the event of component failure. It will also improve automatic recovery from core network component failures (e.g. loss of a single trunk fiber) and eliminate transient "spanning tree convergence storms" that result from a failing (but not yet failed) component

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●		●	●	M	20

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.5	$50,000				

6.6.5.Implementation of DHCP across the HQ Private Network

Initiative Summary	There is currently an Agency project, IPAM, (IP Address Management) that will "develop and deploy IP address management architecture for the Agency to support enterprise IP address management". This project encompasses Agency-wide Dynamic Host Communications Protocol (DHCP) and Domain Naming Services (DNS) services. NASA HQ will participate in the IPAM project and implement the Agency IPAM (DHCP) solution.
Anticipated Benefits	The benefits of DHCP include minimized configuration errors caused by manual IP address configuration, such as typographical errors, as well as address conflicts caused by a currently assigned IP address accidentally being reissued to another computer. TCP/IP configuration is centralized and automated, potentially reducing errors and reducing the level of effort managing IP address assignments. Network administrators can centrally define global and subnet-specific TCP/IP configurations. Address changes for client configurations that must be updated frequently, such as remote access clients that move around constantly, can be made efficiently and automatically when the client restarts in a new location.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
	●	●	●		●	M	3

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.3		.2		.1	

6.6.6.Disk-to-Disk Enterprise Backup

Initiative Summary	Implement a Virtual Tape Library (VTL) to provide disk-based enterprise backup that augments the current ADIC/Quantum I2000 enterprise tape library. Integrate the VTL into the existing tape backup system.
Anticipated Benefits	While tape may still be the medium of choice for off-site data vaulting, disk will become the backup medium of choice for HQ's on-site data. Tape is slower, sometimes substantially, so the VTL will significantly reduce backup and retrieval times. Disks are more durable than tape; they last longer, and they hold up under more frequent overwriting. For this reason, disks provide more reliable data recovery. With the advent of lower cost disks, including solid state devices, providing disk backups is becoming more cost effective than tape. Newer backup approaches that rely on disk, such as Apple's "Time Machine", provide users with seamless access to historical data and backups.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●	●	●	●	P	38

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
1	$400,000	.2	$50,000		

6.6.7.Implement Server Virtualization

Initiative Summary	Evaluate server virtualization architectures and products, and implement the most beneficial choice within the HQ production, SEF, and development environments.
Anticipated Benefits	Reduced hardware requirements, leading to reduced administrative overhead, operating (e.g. power and cooling) and maintenance costs. Also virtual servers can be moved easily between hardware platforms to load balance and to allow for maintenance on specific physical hardware. Virtual servers also allow extremely rapid recovery from hardware failures. Virtual servers also facilitate rapid deployment of standardized service platforms – this decreases personnel time required to deploy new servers and also ensures a consistent security configuration for every service. Maintenance of standard containers also allows for more consistent pre-deployment testing.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●			●	●	●	P	33

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.25	$35,000	.5	$120,000	.25	$200,000

6.7. Application Services

This category provides a service to Information Technology (IT) end-users, and includes the development, operations and maintenance of applications that are not Science and Engineering workstations.

6.7.1. Continuation of ColdFusion Upgrade

Initiative Summary	Upgrade the Intranet and Extranet application servers to the more current ColdFusion version 8 applications development environment.
Anticipated Benefits	NASA HQ is running version 6.0 of ColdFusion, which has reached end-of-life and is known to have serious security vulnerabilities and program bugs. Upgrading will mitigate these issues.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●			●	●	●	M	1

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
4					

6.7.2. Continuation of Oracle Upgrade to 10G

Initiative Summary	Complete the migration of database servers to Oracle 10g. The applications will be migrated one at a time to minimize risk, and compatibility issues will be addressed on a case-by-case basis.
Anticipated Benefits	Oracle Version (9i) is still running on some production servers. This version is not supported on newer server hardware and operating systems. Furthermore, it is more costly to maintain and test across multiple versions of Oracle. As the life cycle replacement of server hardware and server OS continues, this will keep the Oracle version "in-sync", and support initiatives like virtualization and smart card authentication services.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●	●			●	●	M	2

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
1					

6.7.3.Update Multimedia Offsite Support Capabilities

Initiative Summary	Provide a refresh of the software and hardware required to provide multimedia services at offsite locations. This includes presentations made to the Congress and White House, executive level support for launch events at KSC, symposia sponsored by the NASA History Office, and retreats requested by the NASA Administrator. Technologies that will be refreshed include laptops, projectors, portable projection screens, and other necessary hardware and software needed to perform agile support capabilities.
Anticipated Benefits	Maintains and enhances a core capability of the HITSS contract - providing more responsive and up-to-date presentation support to NASA customer at offsite locations.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●		●		●	●	M	31

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$40,000	.5	$40,000	.5	$75,000

6.7.4.Update Multimedia Architecture/Web Streaming

Initiative Summary	Enhance the types of media formats that can be streamed from NASA HQ. This will include updating the software and hardware needed to support the encoding and data delivery of video content (e.g. 24/7 streaming of NASA TV). .
Anticipated Benefits	Allows for increasing the capabilities in the area of 3-D animation, rich graphical interface development, integration of standards based protocols into Web development methodologies, and enhanced desktop and online visualization capabilities. Address maintenance agreements for all software and hardware. Instituting multimedia capabilities that enable NASA HQ Web sites, applications, videos, and outreach products to provide customers with cutting-edge content allows NASA to attract talent to the science field and helps to accomplish the Agency's strategic vision of communicating to the younger generation.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●		●		●	●	M	26

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5		.5		.5	$100,000

6.7.5. *Customer Service Enhancements*

Initiative Summary	Design and development of a comprehensive, current and consistently available information resource using Web 2.0 technologies that provides both summary and detailed information about IT service provided to HQ employees. Relies on an integrated data architecture that defines and links to authoritative data sources instead of maintaining redundant and out-of-date
Anticipated Benefits	Enhances the transfer of knowledge to the customer, as well as feedback from the customer regarding needs and experiences. Provides a basis on which to build a more responsive IT service platform. Allows us to better plan service enhancements to reduce waste, improve consistency, and leverage new service approaches such as virtualization, cloud computing, etc.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●			●	M	29

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
1	$160,000	1	$160,000	1	$160,000

6.7.6. *Implement Automated Requirements, Test Suite, and Test Data Development*

Initiative Summary	Introduces tools and procedures to automate the testing of applications for functionality, validity, performance, and other criteria as stated in the HITSS Software Management Guide. This effort builds upon previous assessments of tools and existing procedures to automate the creation of meaningful test data.
Anticipated Benefits	Stress and functional testing against new and modified applications is currently a manual, time-consuming, and labor-intensive process prone to human error. This project will implement an automated test suite that will predict system behavior with load testing, reduce resource requirements and the duration of test activities, and standardize test methodology. Furthermore, it will facilitate the troubleshooting of defects, whether application, logic, or performance related. As part of this initiative, a standardized requirements tool will be integrated into the application development process. This will ensure the maximum efficiency and benefit of the automated test suite. The residual benefit will be a central repository of standardized application requirements available for reuse.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●	●		●	●	●	M	27

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.5	$185,000	.25	$30,000		

6.7.7.Common Set of Development/DBA tools

Initiative Summary	A common set of tools/software will be deployed across the developer and DBA communities.
Anticipated Benefits	The standardized software toolset will foster collaboration, reduce errors, and increase productivity.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
	●			●	●	M	22

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
.25	$40,000	.25	$40,000	.25	$75,000

6.7.8.MicroPact entelliTrak COTS Tool

Initiative Summary	Investigate entelliTrak to determine the feasibility and desirability of integrating this tool into the NASA HQ environment. If results warrant, implement the tool.
Anticipated Benefits	entelliTrak™ is an enterprise-level, Web-based data tracking application that enables meaningful data management, tracking, retrieval and reporting without custom development. Additionally, entelliTrak affords faster processing of information, improved information assurance, enhanced operational efficiency, and better security.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional Preferred	
●	●			●	●	M	4

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
1	$225,000	1	$150,000	1	$150,000

6.7.9. Update HQ Based Search Engine

Initiative Summary	Look at the implementation of relevant metadata within HQ-based Web sites and applications. The study will include, but not be limited to, the standards and methodologies for the development of interoperable online metadata standards as recommended by the Dublin Core Metadata Initiative and the Agency Enterprise Architecture. The results of the study will be used in the research and implementation of a new search engine.
Anticipated Benefits	Improves the accessibility of NASA information stored in HQ-based web sites and applications by defining appropriate and standardized metadata and by improving the capabilities of the search engine.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●	●			●	●	M	10

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$75,000				

6.7.10. COTS Survey Tool

Initiative Summary	Build upon research and analysis previously done, and include a pilot implementation of a COTS solution for customers to easily create and conduct surveys. Upon acceptance of the recommendation and upon successful completion of the pilot, procure and implement the COTS Survey Tool.
Anticipated Benefits	Many HQ service-providing organizations (from the I&M offices, General Counsel's office, Legislative Affairs Office, etc.) would like to survey the Federal employees and organizations they serve. Provides a common Government employee survey tool that can be easily tailored and adapted to meet organization needs, delivering a cost-effective way to improve customer service throughout HQ.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●	●	●		●	●	M	11

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.25	130				

6.7.11.   Service-Oriented Architecture (SOA)

Initiative Summary	Recommend and, as appropriate, implement a Service-Oriented Architecture (SOA) model for NASA HQ applications. Include a short study on the most capable and compatible SOA gateway candidates for the legacy HQ infrastructure. The technical approach envisions starting a SOA gateway service in the SEF that would a) create a registry of available services, b) manage the security of data sources, and c) provide a common data exchange mechanism for subscribed applications. Includes documenting the as-is application architecture, developing and documenting the go-to architecture, and completing a documented gap analysis between the as-is and the go-to application architectures. Also includes development of a transition plan to bridge the identified gaps and achieve the SOA goal.
Anticipated Benefits	Many applications at HQ could benefit from but are currently unable to share data and services among machines. Currently, each HQ application requires a custom interface to satisfy its particular requirements, resulting in numerous point-to-point information flows that are neither well understood nor well (or even explicitly) managed. As a result, the infrastructure is exceedingly complex, difficult to support, and at greater risk of failure. The power of SOA is in leveraging the use of building-block services, rather than writing many large, monolithic applications that do many of the same things. SOA atomizes IT services and aligns the IT architecture with the business architecture. It enables applications to leverage core services and one another via a published standard interface in business-to-business (B2B) fashion. This drives the re-use model from the code library level up to the service level, so that each IT function need only be designed, deployed, and supported once. Because the interfaces are standardized, they are easy to offer securely to both external and internal clients.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●	●				●	M	13

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$100,000	.25	$60,000	.25	$50,000

6.7.12.   Application Architecture Modeling Tools

Initiative Summary	Use application architecture tools to identify core models that represent the common features of NASA HQ applications within identified categories. Determine ways to maximize automation of the mapping step.
Anticipated Benefits	Movement to a model-driven application architecture is essential in view of shrinking budgets and mandates for greater efficiency. The development of component-model technologies will encourage and enable a planned and controlled view of enterprise management. The current heterogeneous computing environments can be pulled together, making it easier to maintain and integrate new applications. The use of consistent architectures will greatly simplify development projects that create these new applications.

The benefits of a model-based architecture begin at the time of service request submittal. New SRs can be examined to determine if a full or partial capability exists within the architecture and, if found, provide cost-avoidance opportunities. A second benefit is the opportunity for reuse during the development process. A third benefit is increased efficiency in streamlining, downsizing, or merging applications or capabilities. |

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
					●	P	36

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
1	$150,000	.5	$50,000		

6.7.13.   Implement Web Link Checker/Crawler

Initiative Summary	Implement a Web Link Checker/Crawler. A Web crawler (also known as a Web spider or Web robot) is a program or automated script that browses Web sites in a methodical, automated manner.
Anticipated Benefits	The Web Link Checker/Crawler will validate links and HTML code on NASA HQ–hosted Web sites.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
●		●			●	P	34

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
1	$75,000	.2			

6.7.14. Investigate New Web Application Reporting Tools

Initiative Summary	Recommend and, as appropriate, implement a new reporting mechanism and standard for NASA HQ that addresses the shortcomings of Crystal Reports. Develop the recommended support model, an analysis of the one-time and recurring costs for maintenance, and a survey of the availability of personnel in the marketplace with the skill set required to support the new standard. Review multiple vendor offerings and open-source options for providing large-scale reporting capabilities. Investigate Portable Document Format (PDF) and open-standards data formats for HQ compatibility. As appropriate, prototype new reporting system(s) on development systems, test in the SEF, and adopt as the replacement for Crystal Reports. (It should be noted that Crystal 11, which has been partially implemented, may meet all the above requirements.)
Anticipated Benefits	Current NASA HQ reporting tools are based on the Crystal Reports version 10 COTS product and related proprietary data formats. This has resulted in Web applications requiring desktop installations of plug-ins to operate properly, reducing the portability and accessibly of Web applications.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●				●	●	O	41

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.75	$85,000	.25	$100,000		

6.8. IT Management

This category provides CIO functions including management of information assets and implementation of NASA and federal IT-related policies, procedures, regulations, and legislation.

6.8.1.Enhanced Configuration Management Services for HQ IT Assets

Initiative Summary	Integrate a monitoring service such as Patchlink to assure IT asset inventories are automatically updated. IT assets include network components, voice services, appliances, servers, applications, software and affiliated documentation. Build on existing groundwork of the aggregation service, integrated document repository, Standard Operations Procedure repository, and DNS. Integrate a software library where production versions of applications reside. Provide data entry screens for BIA; integrate Change Requests. Update the HQ IT Work Management System to enable both efficiencies and CPIC integration.
Anticipated Benefits	HQ requires a Configuration Management (CM) repository and service that provides query capabilities across our IT assets. A well designed, easy-to-use CM repository and service will increase reuse and therefore reduce overall costs. Moreover the interrelationships and interdependencies of HQ's IT components will be more transparent and provide useful support to Business Impact Analysis, portfolio alignment, service outages, and reporting.

Strategic Drivers Supported						**Priority**	**Rank**
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
					•	M	21

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
1	$60,000	.4	$50,000	1	$70,000

6.8.2. IPv6 Capability for Perimeter and Core

Initiative Summary	OMB has mandated that all Federal Agencies transition their networks to support the routing and use of Internet Protocol Version 6 (IPv6). This initiative is a continuation of prior year Tactical Plan initiatives that have been completed and made the Headquarters network fully capable of supporting IPv6 in a dual stack (IPv4 & IPv6) or native configuration. This initiative is to develop, in coordination with the Agency IPv6 working group and migration team, the Headquarters project implementation plans and schedules.
Anticipated Benefits	Ensures that Headquarters remains in alignment with the Agency project team.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●					●	M	5

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$50,000	1	$75,000	1	$150,000

6.9. IT Security

This category includes Center-wide core IT security activities, for example, coordination of IT Security planning, Certification and Accreditation Official, Center perimeter firewall operations, patch management (Patchlink, and CIS), vulnerability scanning an reporting, FISMA reporting, incident response, penetration testing.

6.9.1.Data Encryption Capability for Enterprise Storage

Initiative Summary	Will implement required data encryption on the enterprise backup tapes that are currently vaulted offsite. Going forward, will encrypt backup tapes before sending offsite or encrypt the onsite source data that is being backed up to tape.
Anticipated Benefits	Will bring NASA into alignment with policy expressed in June 23, 2006 OMB Executive Memo, which instructs agencies that "In those instances where personally identifiable information is transported to a remote site, implement NIST Special Publication 800-53 security controls ensuring that information is transported only in encrypted form." and "In those instances where personally identifiable information is being stored at a remote site, implement NIST Special Publication 800-53 security controls ensuring that information is stored only in encrypted form." Currently, NASA HQ uses a data vaulting vendor to store enterprise backup tapes. Some of these tapes contain PII and are not currently encrypted.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	Common Tools and Services	Mission & Customer Focus	Security	Unified Investment Portfolio	Effective Work-Force	**M**andatory **O**ptional **P**referred	
			●		●	M	32

Resource Requirements					
FY09 FTE	FY09 ODC	FY10 FTE	FY10 ODC	FY11 FTE	FY11 ODC
		.5	$200,000	.5	$200,000

6.9.2. *Caching Proxy/Reverse Proxy Architecture*

Initiative Summary	This project will study the best target architecture and technical approach, then prototype and deploy caching proxy and reverse proxy services at NASA HQ. The scope of this project includes: determining how best to integrate Proxy, Reverse Proxy, and caching into the HQ environment; identifying and acquiring the best products to meet NASA HQ requirements; and installing, testing, piloting, and deploying the hardware and software.
Anticipated Benefits	A proxy service will act as an interim agent when HQ customers access the Internet. The proxy examines the communications protocols (e.g., HTTP) to ensure they are correct and that they are not being used for an unintended purpose (e.g., buffer overflow, remote login). This has significant security benefits. Conversely, a reverse proxy service will act as an interim agent on behalf of HQ servers, protecting them from malformed protocols and intrusion attempts. Caching is the interim storage of frequently retrieved data for the immediate use of the next requester. To the extent that HQ customers browse the same Web sites, a caching proxy will "replay" the text and images already fetched by a previous requester. This greatly improves apparent access speeds while reducing Internet bandwidth utilization. Conversely, a caching reverse proxy for servers will reduce the burden on those servers by re-playing repetitive requests. This will extend useful server life and delay the need for upgrades.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
		●	●		●	M	18

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$75,000				

6.9.3. *Life Cycle Replacement of HQ Firewall Systems HW*

Initiative Summary	Upgrade the current NASA HQ firewall infrastructure to Checkpoint Firewall-1 NGX Release 6.1. Replace existing network firewall hardware.
Anticipated Benefits	The current NASA HQ firewall infrastructure is running Checkpoint Firewall-1 NG AI R55, which reached end-of-life in 2006. All platforms must be upgraded to properly maintain the firewall management and enforcement points within the NASA HQ network. Existing network firewall hardware reaches end-of-life and end-of-vendor support in FY2009.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●			●	●	●	M	7

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.2	$200,000				

6.9.4.Implement Policy Compliance Scanning

Initiative Summary	Investigate available toolsets that are compliant with the Security Content Automation Protocol (SCAP)and determine feasibility and practicality of implementing policy compliance scanning. Tools will include Watchfire® AppScan®, which automates Web application security audits to help ensure Web site security and compliance, and Web Inspect 7, a Web application security assessment tool that analyzes complex Web applications built on emerging Web 2.0 technologies.
Anticipated Benefits	This project will identify a set of tools that can assist in our efforts to ensure and enforce compliance with NIST controls across all applications within the NASA HQ infrastructure. Compliance scanning products provide automated features which will allow HITSS Security to measure current NASA HQ security controls against federal information security guidelines (specifically NIST SP 800-53). In addition, they will allow for more granular assessments of NASA HQ conformance to federal information security guidelines since each security configuration check will be mapped to a corresponding NIST SP 800-53 control. SCAP compliance is an OMB requirement and guarantees that a tool has passed a set of NIST validation tests.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
			●		●	M	6

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$75,000	.25		.5	

6.9.5.Improve Monitoring Capabilities with NETIQ Security Manager

Initiative Summary	This project will build upon the existing production instances to continue implementation of NETIQ Security Manager at HQ.
Anticipated Benefits	NetIQ Security Manager automates security activity reviews, log preservation, threat management, incident response, and change auditing. It provides strong protection of data residing on host systems, including servers, workstations, databases and the Active Directory infrastructure. NetIQ Security Manager enhances the value of an existing security infrastructure by consolidating and archiving log and event data from across the organization. This solution provides a comprehensive built-in security knowledge base for analysis and remediation.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
●			●	●	●	M	14

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.2	$30,000	.2	$30,000	.2	$30,000

6.9.6.Improve IDS Infrastructure

Initiative Summary	This initiative will determine whether the current NASA HQ IDSs are optimally placed within the network infrastructure and whether they should be upgraded or replaced. This project will also determine the applicability and feasibility of using Intrusion Prevention Systems (IPSs).
Anticipated Benefits	Intrusion detection systems (IDSs) detect malicious activity such as denial of service attacks, port scans, or host compromises by monitoring network traffic by reading network traffic and for suspicious patterns. If, for example, a large number of Transmission Control Protocol (TCP) connection requests to a very large number of different ports are observed, it could be evidence of a malicious port scan. Current IDS sensors are approaching end-of-life and do not support IPv6.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
			●		●	M	19

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$50,000	.3	$50,000	.1	

6.9.7.Improve Forensic Capabilities

Initiative Summary	An analysis of available hardware and software forensic tools will be conducted, and the hardware and software needed to establish forensic capabilities for responding properly to security incidents will be procured.
Anticipated Benefits	Computer forensics focuses on finding digital evidence after a computer security incident has occurred. Implementing greater forensics capabilities will facilitate structured investigations when incidents occur, and help HQ security find out exactly what happened and who was responsible.

Strategic Drivers Supported						Priority	Rank
Adapt to Emerging Technologies	**Common Tools and Services**	**Mission & Customer Focus**	**Security**	**Unified Investment Portfolio**	**Effective Work-Force**	**M**andatory **O**ptional **P**referred	
			●		●	M	12

Resource Requirements					
FY09 FTE	**FY09 ODC**	**FY10 FTE**	**FY10 ODC**	**FY11 FTE**	**FY11 ODC**
.5	$30,000	.3	$20,000	.5	$50,000